CLAIMS

[1] A field effect transistor, comprising:

a gate electrode formed on a substrate;

a gate insulation layer formed on the gate electrode:

a source electrode and a drain electrode that are formed on the gate insulation layer;

a n-type semiconductor layer comprising carbon nanotube, formed between the source electrode and the drain electrode so as to contact with the source electrode and the drain electrode; and

a n-type modifying polymer layer formed on the n-type semiconductor layer, the n-type modifying polymer layer being for converting a polarity of the carbon nanotube from an original polarity of p-type into n-type and for stabilizing the polarity.

[2] The field effect transistor according to claim 1, wherein the n-type modifying polymer is an imine nitrogen containing polymer.

[3] The field effect transistor according to claim 2, wherein the imine nitrogen containing polymer is polyalkylene imine.

[4] The field effect transistor according to claim 3, wherein the polyalkylene imine is at least one selected from the group consisting of polyethylene imine, polypropylene imine and polybutylene imine.

[5] The field effect transistor according to claim 1, further comprising a resin protective film formed on the n-type modifying polymer layer.

[6] The field effect transistor according to claim 1, wherein the n-type

modifying polymer is formed by an ink-jet method.

[7] An electrical element array, comprising:

a substrate; and

a n-type field effect transistor and a p-type field effect transistor that are formed on the substrate,

wherein the n-type field effect transistor, comprising:

a gate electrode formed on the substrate;

a gate insulation layer formed on the gate electrode:

a source electrode and a drain electrode that are formed on the gate insulation layer;

a n-type semiconductor layer comprising carbon nanotube, formed between the source electrode and the drain electrode so as to contact with the source electrode and the drain electrode; and

a n-type modifying polymer layer formed on the n-type semiconductor layer, the n-type modifying polymer layer being for converting a polarity of the carbon nanotube from an original polarity of p-type into n-type and for stabilizing the polarity,

wherein the p-type field effect transistor, comprising:

a gate electrode formed on the substrate;

a gate insulation layer formed on the gate electrode:

a source electrode and a drain electrode that are formed on the gate insulation layer; and

a p-type semiconductor layer comprising carbon nanotube, formed between the source electrode and the drain electrode so as to contact with the source electrode and the drain electrode.

[8] The field effect transistor according to claim 7, wherein the n-type

modifying polymer is an imine nitrogen containing polymer.

[9] The field effect transistor according to claim 8, wherein the imine nitrogen containing polymer is polyalkylene imine.

[10] The field effect transistor according to claim 9, wherein the polyalkylene imine is at least one selected from the group consisting of polyethylene imine, polypropylene imine and polybutylene imine.

[11] The field effect transistor according to claim 7, further comprising a resin protective film formed on the n-type modifying polymer layer.

[12] The field effect transistor according to claim 7, wherein the n-type modifying polymer is formed by an ink-jet method.

[13] The electrical element array according to claim 7, further comprising a protective layer made of an imine nitrogen not-containing polymer formed on the p-type semiconductor layer.

[14] The electrical element array according to claim 13, wherein the imine nitrogen not-containing polymer is at least one selected from the group consisting of an acrylic resin, an epoxy resin, polyolefin, polyester, polycarbonate, polystyrene, polyacrylonitrile, polyvinylidene fluoride, polyvinylidene cyanide and polyvinyl alcohol.

[15] The electrical element array according to claim 13, wherein the n-type modifying polymer and the imine nitrogen not-containing polymer are formed by an ink-jet method.

[16] A method for manufacturing a field effect transistor, comprising the steps of:

forming a gate electrode on a substrate;

forming a gate insulation layer on the gate electrode;

forming a source electrode and a drain electrode on the gate insulation layer;

forming a semiconductor layer comprising carbon nanotube on the gate insulation layer and between the source electrode and the drain electrode; and

forming a n-type modifying polymer layer on the semiconductor layer by dispensing with an ink-jet method, the n-type modifying polymer layer being for converting a polarity of the carbon nanotube from an original polarity of p-type into n-type and for stabilizing the polarity.

[17] The method for manufacturing a field effect transistor according to claim 16, wherein the n-type modifying polymer is an imine nitrogen containing polymer.

[18] The method for manufacturing a field effect transistor according to claim 17, wherein the imine nitrogen containing polymer is polyalkylene imine.

[19] The method for manufacturing a field effect transistor according to claim 18, wherein the polyalkylene imine is at least one selected from the group consisting of polyethylene imine, polypropylene imine and polybutylene imine.

[20] A method for manufacturing an electrical element array including a

n-type field effect transistor and a p-type field effect transistor on a substrate, comprising the steps of:

forming a gate electrode on a substrate;

forming a gate insulation layer on the gate electrode;

forming a source electrode and a drain electrode on the gate insulation layer;

forming a semiconductor layer comprising carbon nanotube on the gate insulation layer and between the source electrode and the drain electrode; and

forming a n-type modifying polymer layer only on a part of the semiconductor layer that should be converted into n-type by dispensing in an ink-jet method, the n-type modifying polymer layer being for converting a polarity of the carbon nanotube from an original polarity of p-type into n-type and for stabilizing the polarity.